

XIX.—On the Arrangement of the South American Rats allied to *Oryzomys* and *Rhipidomys*. By OLDFIELD THOMAS.

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WHEN writing some years ago\* on the relation of *Oryzomys* and *Rhipidomys* to each other and the allied forms *Thomasomys* and *Æcomys*, with lists of the forms belonging to each, I indicated certain species as of doubtful position, and I have now had an opportunity to re-examine these in the light of further material.

As then explained, all these rats are divisible into two groups, those with the structure of the palate as in *Oryzomys* (*Oryzomys* and *Æcomys*) and those with it as described and figured by Bangs † in his "*Erioryzomys*" (*Rhipidomys* and *Thomasomys*). Of the first of these groups only one species, "*Hesperomys*" *rufescens*, was referred to as doubtful, and of this animal an additional example, without locality, has lately been found among some old specimens put aside as duplicates, and I have therefore been able to make a further study of it.

The second specimen, although its skull is very dilapidated, happens to show the posterior palate, and is also much younger than the type, with almost unworn teeth, so that an opinion can be formed as to its systematic position.

On studying the characters observable on the two specimens I find that the animal, while belonging to the *Oryzomys*-*Æcomys* series, certainly represents a genus distinct from any of its allies, its molar structure being indeed quite unique in the group.

It may be called:—

RHAGOMYS, gen. nov.

General facies about as in *Æcomys*. Feet modified for an arboreal life, with large plantar and digital pads. Mammæ apparently 1—2 = 6, as in *Rhipidomys*.

Skull broad and low, with broad, smooth, rounded brain-case; supraorbital edges square, not ridged. Zygomatic

\* Ann. Mag. N. H. (7) xviii. p. 442 (1906).

† P. New Engl. Zool. Club, i. p. 96, pl. i. fig. 3 (1900).

plate little projected forward. Palatal foramina short and little open. Posterior palate of the general structure of that of *Oryzomys* and *Ecomys*, not as in *Rhipidomys* and *Thomasomys*.

Upper incisors approaching the vertical, angle with tooth-row about  $80^\circ$ , deep antero-posteriorly, their front surface flattened and inclined inwards, so that the resulting relations of the two teeth and the shapes of their tips are about as in the Dormice, not as in any of the genera above mentioned. Lower incisors of corresponding form, anteriorly, their roots extended backwards much beyond the normal, forming a prominent capsule outside the jaw, halfway between the coronoid and the condyle. Both the shape and implantation of the incisors therefore indicate unusual gnawing powers.

Molars showing a remarkable modification of the structure found in *Ecomys* and *Oryzomys*, for while the number and positions of the cusps are the same, the various foldings and ridges between and connecting the cusps are almost entirely obsolete. The teeth are therefore almost as in certain Phyllostomid bats, with smooth glossy surface and simple conical cusps, which are evenly spaced, slightly slanted backwards, 6, 4, and 2 in number on the three teeth. Below the teeth are similarly modified, the cusps slanting forwards.

Genotype: *Rhagomys rufescens* (*Hesperomys rufescens*, Thos.).

Without a much greater knowledge than I possess of the structural modifications of the molars of this group, and the systematic value that should be attached to their simplification in *Rhagomys*, I should not venture to express a definite opinion as to its affinities, but I should suppose it to be, on the whole, most nearly allied to *Ecomys*, with which it agrees in general facies and palatal structure, but from which, as from every other genus of the group, it may be readily distinguished by the remarkable modification of both incisors and molars above described.

Still younger specimens of *Rhagomys* will be very welcome to show what trace of the normal foldings and ridges is exhibited by the molars when absolutely unworn; but it is evident there cannot be much.

Of the second group, those with the mesopterygoid fossa continued forward between the posterior molars (*Rhipidomys*, *Thomasomys*, &c.), the doubtful species are more numerous, and I find the whole group needs revision, owing to the

diverse characters of some of the forms included in it. In this revision, by removing some of the most diverse into special genera, the groups that remain are rendered more clear-cut and definable, to the great advantage of students of the subject.

There would appear to be five genera of this group that might be recognized, as shown in the following key:—

- A. Molars of normal *Oryzomys* structure, with brachyodont crowns.
  - a. Anterior zygomatic plate not projecting forwards enough to be visible from above.
    - a<sup>2</sup>. Without raised supraorbital beading continued across brain-case.  $M^1$  of evenly oblong shape, its antero-internal tubercle not or little reduced. Mammæ 1—2=6.
      - a<sup>3</sup>. Interorbital region flat, its edges forming overhanging divergent ledges. Feet broad, with flattened pads; claws short, strongly curved, broad at base . . . . . 1. *Rhipidomys*.
      - b<sup>3</sup>. Interorbital region without ledges, though in the larger species the edges may be sharpened. Feet narrow, with high pads; claws longer, less curved, narrower . . . . . 2. *Thomasomys*.
    - b<sup>2</sup>. With raised supraorbital beading continued across brain-case.  $M^1$  not evenly oblong, the antero-internal cusp reduced. Mammæ 2—2=8 . . . . . 3. *Phanomys*.
  - b. Anterior zygomatic plate projecting forwards, visible from above. Skull with long heavy muzzle and small brain-case . . . . . 4. *Delomys*.
- B. Molars of less typical *Oryzomys* structure, the crowns slightly hypsodont. Build of skull suggesting *Oxymycterus* or *Microxus* . . . . . 5. *Inomys*.

The removal of the species *ferrugineus*, *dorsalis*, and *sublineatus* from *Thomasomys* simplifies the definition and reduces the range of that genus, as these three were outlying Brazilian forms with a different mammary formula, as compared with the true *Thomasomys*, which inhabits the northern part of the Andean area, with extension eastwards to British Guiana.

One Andean species also, *incanus*, shows such marked special characters that I have formed a peculiar genus for its reception.

The following are short diagnoses of the genera now recognized, with lists of the species included in them.

## 1. RHIPIDOMYS, Tschudi.

Form modified for arboreal life. Tail heavily pencilled. Feet broad, the pads broad and low. Claws short, strongly curved, their breadth at base equalling or exceeding their length on their concave edge. Mammæ 1—2=6.

Skull with large rounded brain-case. Interorbital region broad and flat, its edges sharpened into ledges more or less overhanging the orbits, but without any upwardly projecting beading.

Antero-internal cusp of  $m^1$  slightly reduced, but not sufficiently so to affect the general oblong shape of the tooth.

Genotype. *R. leucodactylus*, Tschudi (*Hesperomys leucodactylus*, Tsch.).

Species and subspecies:—

*bovallii*, Thos.  
*caucensis*, All.  
*cearanus*, Thos.  
*cocalensis*, All.  
*couesi*, All.  
*elatturus*, Osg.  
*equatoris*, Thos.  
*fervidus*, Thos.  
*fulviventris*, Thos.  
*goodfellowi*, Thos.  
*latimanus*, Tomes.  
*lucullus*, Thos.  
*macrurus*, Gerv.  
*mastacalis*, Lund.

*microtis*, Thos.  
*milleri*, All.  
*mollissimus*, All.  
*nitela*, Thos.  
*ochrogaster*, All.  
*pictor*, Thos.  
*quindianus*, All.  
*scandens*, Goldm.  
*sclateri*, Thos.  
*similis*, All.  
*yuruanus*, All.  
*venezuelæ*, Thos.  
*venustus*, Thos.

## 2. THOMASOMYS, Coues.

Syn. *Erioryzomys*, Bangs.

Form not specially modified. Tail well haired. Feet of normal proportions, the pads high, not broadened. Claws comparatively long and slender, not unusually curved. Mammæ 1—2=6.

Skull of medium proportions. Interorbital region narrower than in *Rhipidomys*, sometimes concave, its edges generally rounded, but sometimes, in the larger species, raised and sharpened, but never forming overhanging ledges or distinct beading.

$M^1$  of normal oblong shape.

Genotype. *T. cinereus*, Thos. (*Hesperomys cinereus*, Thos.).

## Species and subspecies :—

<i>altorum</i> , All.	<i>monochromos</i> , Bangs.
<i>aureus</i> , Tomes.	<i>niveipes</i> , Thos.
<i>lewops</i> , Thos.	<i>notatus</i> , Thos.
<i>cincriveiter</i> , All.	<i>paramorum</i> , Thos.
<i>daphne</i> , Thos.	<i>popayanus</i> , All.
<i>gracilis</i> , Thos.	<i>prætor</i> , Thos.
<i>hylophilus</i> , Osg.	<i>princeps</i> , Thos.
<i>ischyrus</i> , Osg.	<i>pyrrhonotus</i> , Thos.
<i>kalinowskii</i> , Thos.	<i>rhoadsi</i> , Stone.
<i>laniger</i> , Thos.	<i>taczanowskii</i> , Thos.
<i>mucconelli</i> , de Wint.	<i>vestitus</i> , Thos.

## 3. PHÆNOMYS, gen. nov.

Form normal. Tail short-haired. Claws slender, not specially curved. Mammæ 2—2=8.

Skull slender, of normal proportions. Interorbital region slightly concave, its edges forming definite raised beadings, continued backwards across the parietals.

Incisors rather heavy.  $M^1$  not so evenly oblong as in the other genera, the antero-internal cusp more definitely reduced.

Range. South-eastern Brazil (Bahia, Rio Janeiro).

Genotype and only species. *Phænomys ferrugineus*, Thos. (*Oryzomys ferrugineus*, Thos.).

## 4. DELOMYS, gen. nov.

Form normal. Tail quite short-haired, about as in *Oryzomys*. Claws normal. Mammæ 2—2=8 in two specimens of *D. dorsalis* from Rio Grande do Sul, 1—2=6 in one, believed to represent a new subspecies, from Rio Janeiro. The latter number may be an abnormality.

Skull long, with long heavy muzzle and small brain-case. Interorbital region rather broad, smooth, its edges rounded, or slightly squared, not ridged or beaded. Zygomatic plate projected forwards above far enough to be seen from above, that of all the other forms mentioned in the present paper absolutely without projection.

Molars rather narrow.  $M^1$  evenly oblong.

Range. South-eastern Brazil, from Espiritu Santo to Rio Grande do Sul.

Genotype. *Delomys dorsalis* Hens. (*Hesperomys dorsalis*, Hens.).

Other forms :—“*Oryzomys*” *sublineatus*, Thos. and a new subspecies of *dorsalis* described below.

5. *INOMYS*, gen. nov.

External characters as in *Thomasomys*; mammæ not known.

Skull recalling in shape that of *Oxymycturus* or *Microxus*, with broad low rounded brain-case and long narrow snout. Interorbital region smoothly rounded. Incisors small and delicate.

Molars rather narrow, their crowns higher than in any other of the genera now dealt with. Their foldings, however, essentially as in *Oryzomys* and all the present group of genera, not as in *Oxymycturus*.

*Range*. Central Peru. (Only known from Vitoc.)

Genotype and only species. *Inomys incanus*, Thos. (*Oryzomys incanus*, Thos.).

The distinction of this genus rests mainly on the peculiar shape of the skull, which, with its broad low brain-case, long narrow snout, rounded interorbital region, and small incisors curiously recalls that of an *Oxymycturus* or *Microxus*. Its molars, however, show the typical structure of the molars of the present group, and its interparietal is of full normal size. Its removal from *Thomasomys* renders far more uniform the skull-shape of the species to be referred to that genus, as it was the one outstanding species in this respect.

The following is the description of a new subspecies of *Delomys*:—

*Delomys dorsalis collinus*, subsp. n.

General characters of true *dorsalis* of Rio Grande do Sul, the colour approximately the same, and the fur similarly soft and rich, and so equally differing from the harsh-furred *D. sublineatus* of Espiritu Santo. But the size, and especially the size of the teeth, averages greater, the molar tooth-row measuring 5.0 mm. in length, while in a considerable series of true *dorsalis* this measurement is only 4.5 to 4.7 mm., the teeth of *collinus* being also perceptibly broader. No doubt the two forms will be found to intergrade, but the difference is so constant locally that it should be recognized by name. In the series available the belly is rather more whitish and less buffy, and the underside of the tail is less decidedly whiter than the upper than is the case in *dorsalis*.

Mammæ in the only female 1—2=6, instead of 2—2=8

as in *D. dorsalis*, but this may possibly be an individual aberration.

Dimensions of the type, measured on a spirit-specimen :—

Head and body 130 mm. ; tail 132 ; hind foot 30 ; ear 21.

Skull, greatest length 33·8 ; condylo-incisive length 29·5 ; zygomatic breadth 16·3 ; interorbital breadth 5 ; palatilar length 13·3 ; palatal foramina 6·8 ; upper molar series 5·0.

*Hab.* N.E. São Paulo and neighbouring parts of Rio Janeiro. Type from Itatiaya, Rio Janeiro, 4800 ft. ; other specimens from Piquete, São Paulo, 2500 ft. (*A. Robert*), and Alto da Serra, São Paulo (*São Paulo Museum*).

*Type.* Adult male. B.M. No. 14.2.23.12. Collected 22 August 1913 and presented by Prof. J. P. Hill, F.R.S. Six specimens examined.

Our series of *D. dorsalis* consists of four spirit-specimens from Rio Grande do Sul, the type-locality of the species, collected by Dr. H. von Ihering, and a nice set of skins from Roça Nova, Parana, obtained by Alphonse Robert in 1903.

## XX.—*Two new Rats of the Rattus confucianus Group.*

By OLDFIELD THOMAS.

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My attention having been drawn to some rats referred to *Rattus confucianus* from Formosa presented by Mr. Goodfellow, I have made an examination of them and find that not only do they represent a new species allied to the large Sze-chwan *R. excelsior*, but that the specimens of "*R. confucianus*" from the Imperial Tombs, E. of Peking, collected by Mr. Malcolm Anderson, also need description.

### *Rattus culturatus*, sp. n.

Size of *R. excelsior* ; skull with supraorbital beading.

General appearance about as in *R. excelsior*, that is, very like *R. confucianus* but larger. Fur long and shaggy.

Colour varying from mouse-grey to hair-brown, more "saturate"-looking than in *R. confucianus* and *excelsior*, the latter especially being a much browner animal. Under surface as usual sharply contrasted creamy white, the white